Improving Safety While Improving Productivity: A Suggestion

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Question

Do you have any workplace mishaps that

- Are occurring *much too often*,
- Have been *troublesome for a long time,* and
- Have had several remedies applied, but *none have fixed the problem?*

Outline

- The “System Think” Concept

- Aviation System Think Success
  - Industry Level
  - Manufacturer Level

- Suggestion for Recurring Problems

- Improving Productivity

But First . . . NTSB 101

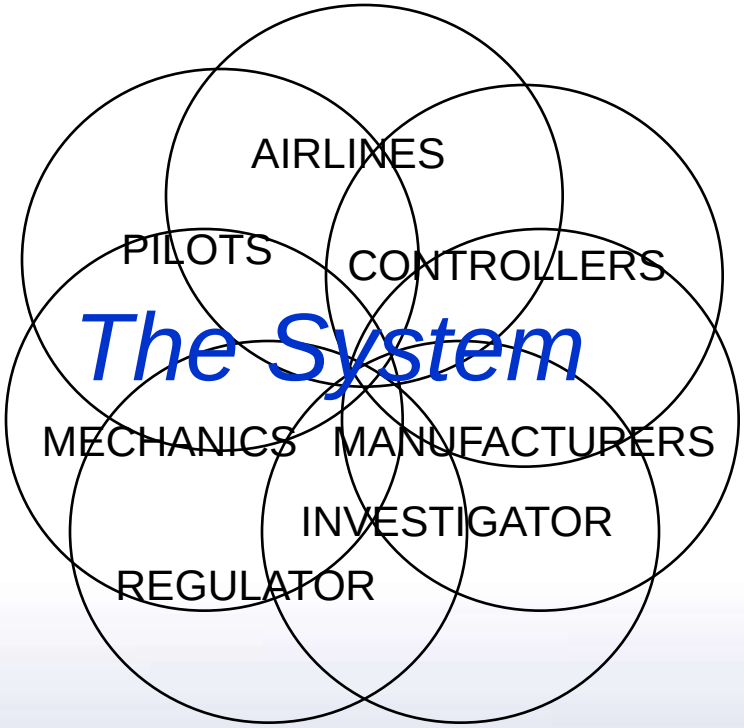
- Independent federal agency, investigate transportation mishaps, all modes
- Findings, recommendations based upon evidence rather than politics
- Determine probable cause(s) and make recommendations to prevent recurrences
- *SINGLE FOCUS IS SAFETY*
- Primary product: Safety recommendations
  - Favorable response > 80%

Troubling, Too-Frequent Mishaps

- Suggest a voluntary collaborative effort
- Suggest focusing on trends, rather than individual events
  - If trend is longstanding, problem is probably systems and processes rather than people
  - Thus, punishment of individuals will probably not solve the problem (and may make it worse)
  - Employees are more willing to participate in the investigation because it is focused on improvement rather than punishment

The Challenge: Increasing Complexity

- More system *interdependencies*
  - Large, complex, interactive system
  - Often tightly coupled
  - Hi-tech components
  - Continuous innovation
  - Ongoing evolution
- Safety issues are more likely to involve *interactions between parts of the system*



Effects of Increasing Complexity:

More "Human Error" Because

- System More Likely to be Error Prone
- Operators More Likely to Encounter Unanticipated Situations
- Operators More Likely to Encounter Situations in Which *"By the Book"* May Not Be Optimal *("workarounds")*

The Result:

Front-Line Staff Who Are

- Highly Trained
- Competent
- Experienced,
- Trying to Do the Right Thing, and
- Proud of Doing It Well

. . . Yet They Still Commit

Inadvertent
Human Errors

The Solution: System Think

Understanding how a

change in one subsystem

of a complex system may

affect other subsystems

within that system

When Things Go Wrong

How It Is Now . . .	*How It Should Be . . .*
You are highly trained	You are human
and	*and*
If you did as trained, you would not make mistakes	Humans make mistakes
so	*so*
You weren't careful enough	Let's *also* explore why the system allowed, or failed to accommodate, your mistake
so	*and*
You should be PUNISHED!	Let's IMPROVE THE SYSTEM!

The Health Care Industry

To Err Is Human:

Building a Safer Health System

"The focus must shift from blaming individuals for past errors to a focus on preventing future errors by designing safety into the system."

Institute of Medicine, Committee on Quality of Health Care in America, 1999

"System Think" via Collaboration

Bringing all parts of a complex system together to collaboratively

- Identify potential issues
- *PRIORITIZE* the issues
- Develop solutions for the prioritized issues
- Evaluate whether the solutions are
  - Accomplishing the desired result, and
  - Not creating unintended consequences

Objectives:

Make the System

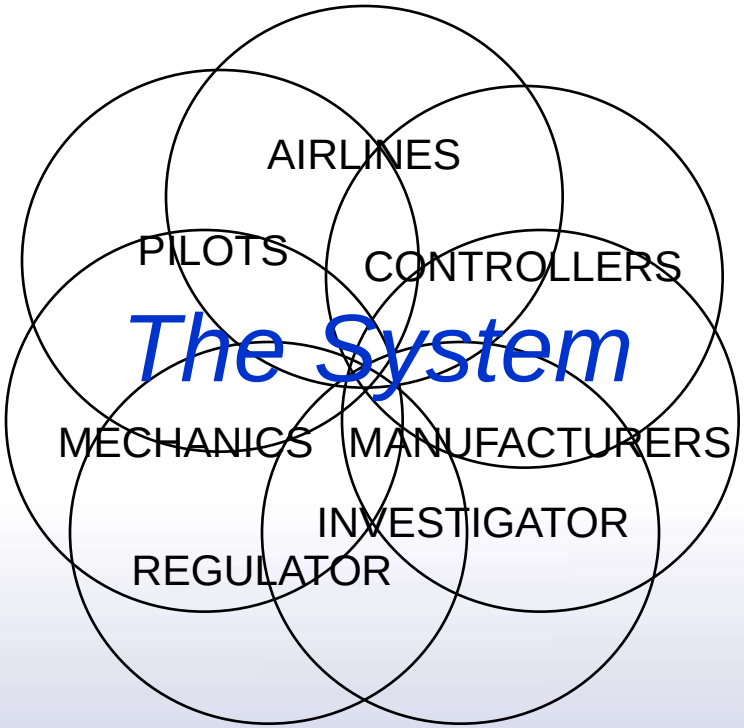
(a) Less Error Prone

and

(b) More Error Tolerant

Aviation Industry Collaboration

- Engage *All* Participants In Identifying Problems and Developing and Evaluating Remedies
- Airlines
- Manufacturers
  - *With the systemwide effort*
  - *With their own end users*
- Air Traffic Organizations
- Labor
  - *Pilots*
  - *Mechanics*
  - *Air traffic controllers*
- Regulator(s)



Success Story

65% Decrease in Fatal Accident Rate, 1997 - 2007

largely because of

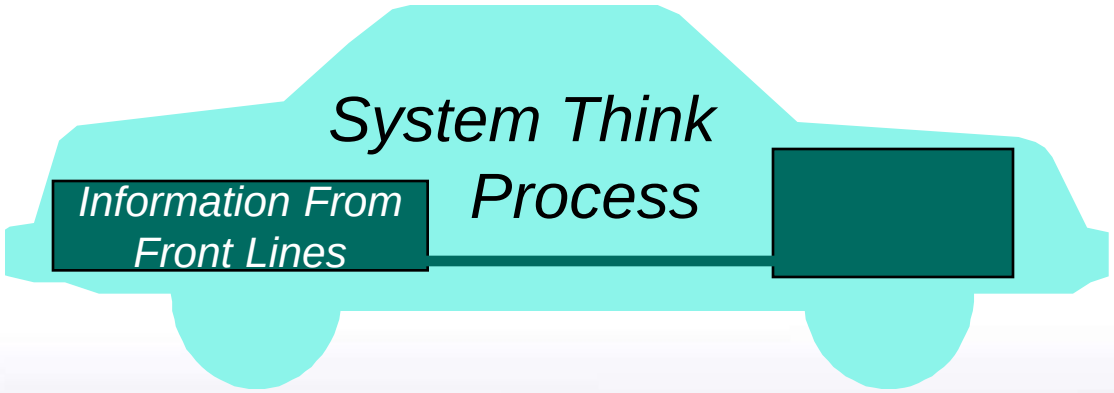
System Think

fueled by

Proactive Safety Information Programs

P.S. Contrary to conventional wisdom, *productivity also increased!*

Process Plus Fuel Creates A Win-Win



Improved
Safety
- and -
Improved
Productivity

Major Paradigm Shift

– Old: The regulator identifies a problem, proposes solutions

- Industry skeptical of regulator's understanding of the problem
- Industry fights regulator's solutions and/or implements them begrudgingly

– New: Collaborative "System Think"

- Industry is involved in identifying the problem
- Industry "buy-in" re solutions because everyone had input, everyone's interests considered
- Process is *completely voluntary*
- Prompt and willing implementation . . . *and tweaking*
- Solutions probably more effective and efficient
- Unintended consequences much less likely

Challenges of Collaboration

- Human nature: "I'm doing great . . . *the problem is everyone else"*
- Participants may have competing interests, e.g.,
  - Labor/management issues
  - May be potential co-defendants
- Regulator probably not welcome
- Not a democracy
  - Regulator must regulate
- Process is voluntary, but all must be willing, *in their enlightened self-interest,* to leave their "comfort zone" and think of the System

TRUST

Success at Another Level

Aircraft manufacturers are increasingly seeking input, from the earliest phases of the design process, from

- *Pilots* (*User* Friendly)
- *Mechanics* (*Maintenance* Friendly)
- *Air Traffic Services* (*System* Friendly)

Collaboration at Other Levels?

- Entire Industry
- Company (Some or All)
- Type of Activity
- Facility
- Team

Moral of the Story

Anyone who is

involved in the problem

should be

involved in the solution

Collaboration Suggestion

- Select a longstanding troublesome process that has resulted in mishaps too often
- Identify everyone who has a “dog in the fight” *– both within and outside of the organization*
- Create an “Improvement Team” that includes all of the above
- Task the Improvement Team with identifying the problem(s) and developing process improvements
- Evaluate whether the improvements
  - Are producing the desired result
  - Have no unintended consequences

How Can This Improve Productivity?

Safety *Poorly* Done	Safety *Well* Done
1. Punish/re-train operator	Look beyond operator, also consider system issues

- Poor workforce morale

- Poor labor-management relations

- Labor reluctant to tell management what's wrong

- Retraining/learning curve of new employee if "perpetrator" moved/fired

- Adverse impacts of equipment design ignored, problem may recur because manufacturers are not involved in improvement process

- Adverse impacts of procedures ignored, problem may recur because procedure originators (management and/or regulator) are not involved in improvement process

Improving Productivity (con't)

Safety *Poorly* Done	Safety *Well* Done
2. Management decides remedies unilaterally	Apply "System Think," *with workers*, to identify and solve problems
3. Remedies based upon instinct, gut feeling	Remedies based upon evidence (including info from front-line workers)

- Problem may not be fixed
- Remedy may not be most effective, may generate other problems
- Remedy may not be most cost effective, may reduce productivity
- Reluctance to develop/implement remedies due to past remedy failures
- Remedies less likely to address multiple problems

- Same costly results as No. 2, above

Improving Productivity (con't)

Safety *Poorly* Done	Safety *Well* Done
4. Implementation is last step	Evaluation after implementation

- *No measure of how well remedy worked (until next mishap)*
- *No measure of unintended consequences (until something else goes wrong)*

So . . . Is Safety Good Business?

- *Safety implemented poorly can be very costly (and ineffective)*
- *Safety implemented well, in addition to improving safety more effectively, can also create benefits greater than the costs*

Thank You!!!

Questions?